REMARKS

This paper is responsive to the Office Action dated July 6, 2007. Applicants have not amended any of the claims. Claims 30-64 remain pending.

Allowable Subject Matter

In the Office Action, the Examiner indicated that claims 30-35 are allowable in their present form. Applicants thank the Examiner for these favorable remarks.

Rejections for Obviousness-type Double Patenting:

The Examiner provisionally rejected claims 42, 46, and 47 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 42 and 46 of copending Application No. 10/790,965.

The Examiner provisionally rejected claims 42 and 46 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 44 and 48 of copending Application No. 10/791,064.

The Examiner provisionally rejected claims 36-64 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-20 of copending U.S. Patent No. 6,890,704.

Applicants respectfully traverse these rejections. The double patenting rejections are in clear violation of MPEP 804.01 "Prohibition of Double Patenting Rejections Under 35 USC 121." The filing of the present application was a direct result of various Restriction Requirements imposed by the USPTO. Therefore, the double patenting rejections are clearly prohibited under MPEP 804.01, and must be withdrawn.

Attached with this response is a copy of an Office Action mailed September 30, 1999 for parent application 09/055,825. In this Office Action, the Patent Office restricted different claims as being directed to the following patentably distinct subject matter: methods, masters, optical disk substrates (i.e., replicas), and stampers.

Also attached with this response is a copy of another Restriction Requirement mailed April 9, 2003 for parent application 09/850,252. In this Office Action, the Patent Office again restricted different claims as being directed to masters, optical disk substrates (i.e., replicas), and stampers. Notably, the present Examiner (Examiner Huber) imposed the Restriction Requirement mailed on April 9, 2003.

In view of the subject matter restrictions imposed by the Patent Office in parent application 09/055,825, and again in parent application 09/850,252, the current double patenting rejections are prohibited under MPEP 804.01, and must be withdrawn.

Claim Rejections Under 35 U.S.C. § 102 and 35 U.S.C. § 103

In the Office Action, the Examiner rejected claims 36-39 and 41-64 under 35 U.S.C. 102(b) as being anticipated by Suzuki et al. (US 4,947,384).

In the Office Action, the Examiner rejected claim 40 under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. (US 4,947,384).

Applicants respectfully traverse the rejections. The passages of Suzuki '384 relied upon by the Examiner are mis-translations of the Japanese priority document. In particular, the term "μm" ("micrometer") in Suzuki '384 was mistranslated to "μin" ("microinches"). The term "μm" does not translate directly to "μin," but requires metric-to-English conversion of the units. The mis-translation in Suzuki '384 is very apparent as the dimensions of Suzuki '384, listed as being conventional, are clearly meant to be micrometers rather than microinches.

Furthermore, the teaching of Suzuki '384 is non-enabling of the listed dimensions in microinches. Given the fact that the listed dimensions in Suzuki '384 are clearly mis-translated, and the fact that the teaching of Suzuki '384 fails to enable any way to achieve such dimensions in a replica disk, the rejections must be withdrawn.

Translation Error in Suzuki

Attached with this response is a translation of the background section of Japanese Application 62-90081, which is the Japanese priority document to Suzuki '384. As can be seen in this document, Japanese Application 62-90081 describes conventional track pitches as being 1.6 μm (micrometers), which corresponds to 1600 nanometers. Japanese Application 62-90081

also describes the width of the guiding groove as being 0.8 μm (micrometers), which corresponds to 800 nanometers.

Suzuki '384 was mis-translated. In particular, the term "μm" was translated to "μin." However, the term "μm" does not accurately translate directly to "μin," and Suzuki '384 fails to contemplate the disclosed dimensions in "μin." Specifically, the term "μm" does not translate directly to "μin," but requires metric-to-English conversion of the units, which appears to have been mistakenly overlooked in Suzuki '384.

Suzuki '384 provides nothing more than a mis-translation of the term "μm". It is this mis-translation, and not the actual teaching of Suzuki '384, that corresponds to the dimensions recited in Applicants' claims.

The fact that Suzuki '384 provides nothing more than a mis-translation of the term "μm" is apparent from the teaching of Suzuki '384. In particular, Suzuki '384 discusses the 1.6 μin track pitches in the Background section, e.g., implying that such track pitches were conventional at the time of the filing of Suzuki '384. However, at the time of the Suzuki '384 patent filing, 1.6 μm track pitches were conventional for compact disc (CD) formats, not 1.6 μin track pitches. Clearly, Suzuki '384 contemplated 1.6 μm track pitches as the conventional "Background" art, and not 1.6 μin track pitches, as provided by the mis-translation. One of ordinary skill in the art would have immediately recognized this discrepancy.

Suzuki is Non-Enabling of the Dimensions Required by Applicants' Claims

Suzuki (US 4,947,384) and its priority document JP 62-90081 are in agreement with regard to all of the commonly available background information, with the exception that JP 62-90081 expresses the conventional track pitch as 1.6 micrometers and conventional groove dimension of 0.8 micrometers. Track pitch of 1.6 micrometers and groove dimensions of 0.8 micrometers are consistent with conventional dimensions of the filing period of Suzuki '384, while 1.6 microinch track pitch and groove dimensions of 0.8 microinch are far smaller than any conventional optical recording processes were capable of at the priority date and filing date of Suzuki '384.

The relied upon passages of Suzuki merely describe the standard mastering processes of focused scanning laser beam exposure using single layer photoresist. This was conventional and

commonly practiced for the 1.6 micrometer track pitch and 0.8 micrometer groove dimension described in priority JP 62-90081. Suzuki '384 refers to the conventional nature of this background teaching frequently in the background section, and then describes the invention of Suzuki '384 in Summary and Detail Description sections. The description of Suzuki '384 describes "the spot diameter of the laser beam for read-out is ordinarily within the width of the land portion" (col.1, line 50-54) and also describes tracing singular land portions using the laser spot (col.1, lines 39,40) and laser beam actuated to trace out singular land portion (col.1, line 45).

Clearly, one of ordinary skill in the art would have recognized that all of these descriptions are unattainable for track pitches that are much smaller than the focal spot size of the laser beam.

The present application, in contrast, describes the optical physics limitation of a focused laser spot size as depending on wavelength and lens numerical aperture, with limitations of 220 nm even for UV light (350nm wavelength) and highest Numerical Aperture (NA=0.92). Suzuki '384 does not enable any 40nm laser spot size that would be required to attain track pitch dimensions of 1.6 microinch and groove dimension of 0.8 microinch. The mis-translated dimensions of 1.6 microinch track pitch and of 0.8 microinch groove dimensions are not enabled.

As further evidence that the teaching of Suzuki '384 is descriptive of conventional track pitches at 1.6 micrometer and conventional groove dimensions of 0.8 micrometer (rather than microinches), Applicants note that Suzuki '384 describes the optical push-pull tracking method in col. 1, lines 60-65, as justification for the dimensions listed in Suzuki '384. The push-pull method, as it is commonly called, relies on the optical diffraction of the incident focused laser light into +/- 1^{st} order diffraction beams, which interfere with the zero order reflected beam to create a trackable signal from a split tracking detector. If Suzuki '384 actually contemplated a 40nm track pitch, then no optical diffraction would occur since the diffraction grating would be significantly less than the incident wavelength (hence resulting in no push-pull tracking signal). Furthermore, Suzuki's teaching does not enable any way to obtain an optical diffraction pattern from a pattern of sub-optically diffracting pitch (i.e. 40nm), but instead presumes conventional tracking means, which is consistent with 1.6 micrometer pitch of priority document JP 62-90081.

In addition, Suzuki '384 teaches a laser beam focused on a photoresist layer for the mastering step (see col. 2, line 4-6), but does not provide any enabling disclosure that describes

how to provide a 40nm dimension laser spot size (which is actually below the limits of optical physics at ~220nm).

In short, Suzuki '384 describes conventional processes from the time frame of the filing of Suzuki '384 (e.g., 1987-1988), and fails to address any of the challenges of translating 1.6 micrometers track pitches to 1.6 microinches (40nm) track pitches. On the contrary, Suzuki '384 teaches conventional processes from the time frame of 1987-1988, consistent with the dimensions cited in priority document JP 62-90081. Suzuki simply fails to disclose any way to attain track pitches anywhere near 1.6 microinches, or groove dimensions anywhere near 0.8 microinch.

Land *top* width has not been properly addressed by the Examiner

In addition to the arguments above, Applicants also note that the Examiner has not properly addressed the land top width features of Applicants' claims. For example, claim 36 specifically recites land tops that have a width that is greater than 25 percent of the track pitch. Claim 39 defines land tops that have a width that is greater than 35 percent of the track pitch. Claim 40 defines land tops that have a width that is greater than 50 percent of the track pitch. Other dependent claims also recite similar land top dimensions.

In addressing these land top width features of claims 36, 39 and 40, the Examiner stated that Suzuki '384 teaches that the width of the groove bottom and the width of the land top is 0.8 microinches. However, Suzuki '384 fails to state any feature sizes for land tops.

Furthermore, the dimensions discussed in Suzuki '384 with respect to the grooves appear to refer to the average width of the grooves, and not the width of groove bottoms that would correspond to land tops if a 2nd-Generation stamper were used. Conventional groove bottoms are much narrower than the groove dimensions defined by Suzuki '384, and sizes of land tops are not even discussed in Suzuki '384. Accordingly, Applicants submit that the Examiner has failed to properly address the claim limitation of claims 36, 39 and 40 that requires land tops that have a width that is greater than 25 percent of the track pitch. With regard to claim 40, it should be very apparent that the "groove dimensions" discussed in Suzuki '384 (e.g., near 50 percent of the track pitch) would never define land top widths that are even close to 50 percent of the track pitch.

Track pitch less than 2 multiplied by a laser spot size is a structural feature

Claim 42 requires a track pitch of the replica disk to be less than 2 multiplied by a laser spot size associated with a laser used to perform laser etching of the master disk. This feature is a structural limitation of the replica disk, i.e., a structural limitation of the track pitch on the replica pattern. In this case, the track pitch is simply defined relative to a laser spot size associated with a laser used to perform laser etching of the master disk. Nothing in Suzuki '384 discloses or suggests a track pitch of a replica disk that is less than 2 multiplied by a laser spot size associated with a laser used to perform laser etching of the master disk, and the Examiner has failed to address this structural feature of Applicants' claims. Various dependent claims further require a track pitch less than 1.6 multiplied by the laser spot size associated with a laser used to perform the laser etching.

Groove depths and land top widths

Claim 48 specifically recites a track pitch less than 700 nanometers, groove depths less than 120 nanometers, and land tops less than 200 nanometers wide. The various dependent claims to independent claim 48 further limit these dimensions.

For these features, the Examiner again relied upon the mis-translation of Suzuki '384. In addition, the Examiner stated that Suzuki '384 teaches "that the depth of the groove is one eighth of the reading laser beam wavelength, thus inherently disclosing a groove depth within the claimed range."

Applicants are perplexed by these assertions by the Examiner. Nothing in Suzuki '384 teaches that the depth of the groove is one eighth of the reading laser beam wavelength. Rather, Suzuki '384 simply states that "in order to maximize the tracking error signal by push-pull methods with $\lambda/8$ depth of guiding groove and 1.6 μm (sic) track pitch, the maximum signal can be obtained if the width of the guiding groove is 0.8 μm (sic)." Nothing in this passage of Suzuki '384 suggests any groove depth dimensions, or any land top dimensions. Instead, this passage describes push-pull methods. The rejections are clearly improper, as nothing in Suzuki '384 (either explicitly or inherently) suggests groove depths less than 120 nanometers and land tops less than 200 nanometers wide.

Lands that correspond to interrupted grooves

In addition to reciting feature dimensions that are not suggested in Suzuki '384, claim 58 specifically recites lands in the replica disk that correspond to interrupted grooves in the master disk. In particular, claim 58 requires a surface relief pattern defined by lands that correspond to interrupted grooves formed in the master disk, wherein land tops of the lands are less than approximately 200 nanometers wide. In this way, the lands on the replica disk are not a continuous spiral or concentric circles on the replica disk, but comprise interrupted lands that correspond to interrupted grooves of the master.

The Examiner failed to even address this claim limitation. In particular, the Examiner identified nothing in Suzuki '384 that suggests any lands that correspond to interrupted grooves in the master disk, much less lands that correspond to interrupted grooves in the master disk and define land tops less than approximately 200 nanometers wide.

Conclusion

All claims in this application are in condition for allowance. In view of the foregoing arguments, Applicants respectfully request reconsideration and prompt allowance of all pending claims. Applicants do not acquiesce to any dependent claim rejections that are not specifically addressed above, but reserve further comment at this time on such claims.

Please charge any additional fees or credit any overpayment to deposit account number 09-0069. The Examiner is invited to telephone the below-signed attorney to discuss this application.

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